AMENDMENTS TO THE SPECIFICATION

On page 3, paragraphs 3 and 4, please amend to read as follows:

The invention provides geogrids or mesh structures ~~as set forth in Claims 1,8, 10, 15, 40, 41, 42 or 43~~ and methods ~~as set forth in Claims 22, 23, 32, 37, 39, 44 or 45~~. The invention also extends to a method of strengthening a particulate material, comprising embedding in the particulate material a geogrid of the invention, and further extends to a particulate material so strengthened and to a geotechnical construction comprising a mass of particulate material strengthened by embedding therein a geogrid of the invention.

~~The geogrid of Claims 1 and 15 and geogrids made by the method of Claims 22, 23 and 37~~ Geogrids of the invention provide pairs of angled strands between the transverse bars or further oriented strands and reduces any tendency for relative movement between the strands and the soil, creating a stiffer and more effective reinforcement anchor. In effect, it has been found that by careful choice of the number and geometry of the holes in the starting material, angled strands could be produced as an integral feature of the geogrid design. Possible advantages of such geogrids can be increased in-plane torsional stiffness or rigidity (important for interlock), increased flexural modulus, improved multi-directional property performance, diverse soil or aggregate interlock properties, greater resistance to shear forces and the enhanced ability to carry and/or distribute greater loads in general and radial loads in particular. If a piece of the geogrid is tested with a fully restrained periphery, for a given load normal to the plane of the geogrid, the deflection is lower than for comparable conventional biax geogrids (increased flexural modulus), and the deflection is less localised around the point of application of the load, i.e., is more evenly distributed across the sample. This indicates that the load on the conventional geogrid is born by a relatively small number of strands within the immediate loading area (a four-strand junction) whereas the geogrid of the invention has more paths to carry the load away from the loading area (an at least six-strand junction). Testing was carried out only with a relatively small load, but it is believed that there is good correlation between the applied load and the corresponding deflection of the geogrid and that extrapolations to higher

loads would be valid. Compared to a comparable conventional biax geogrid, the geogrid of the invention has a combination of tensile strength and stiffness properties that improves the provision of multi-axial performance by permitting the dispersion of an applied load over 360°. All these properties are important when considering the interlock of the geogrid with soil or aggregate.

On page 4, paragraph 1, please amend to read as follows:

In ~~the~~ one geogrid ~~of Claim 8~~, ~~the~~ triangular meshes of the geogrid provide a robust structure having high tensile strengths along said tensile members. One series of tensile members can extend in the MD or in the TD, and it is found that in the direction at right angles, the geogrid has good strength because extension would require buckling of oriented strands running at right angles to the force applied and such buckling is impeded by soil in which the geogrid is buried. The triangular mesh produces a structure with quasi isotropic properties in the plane of the geogrid, which enables the geogrid to distribute load more uniformally in geotechnical applications; if the strength of the geogrid is measured around 360°, there will be at least six peaks but the dips are less great than with rectangular structures. Thus the geogrid is more able to carry radial stresses, with less deformation, leading to a stiffer and more effective anchor in soil reinforcing applications and also leading to more effective load distribution when used to support, e.g., wheeled vehicle loading or point loading such as imposed by heavy construction equipment. Oriented polymers are particularly well suited for geotechnical applications as the typical stresses are highly directional along the tensile members, the high directionality of oriented polymer materials enabling the material's stiffness and strength to be directed along the length. Using the invention, roughly 50% by weight of the material is in the strands, the remainder being in the junctions, as is also the case for comparable conventional biax geogrids. However, the starting material thickness can be reduced significantly, while producing a geogrid with similar soil reinforcement properties. For example, the equivalent starting material thickness for a geogrid of the invention can be 4.7 mm while a comparable conventional biax geogrid has a starting material thickness of 6.8 mm. One reason is that the strands in the geogrids of the invention can be wider (due to having

wider strand-forming zones in the starting material); thus if required, the geometry of the starting material allows the strands to be thinner and wider, which increases the in-plane torsional strength of the geogrid.

On page 5, paragraph 2, please amend to read as follows:

The ~~methods of Claims 27 and 33~~ invention can provide ~~two techniques~~ a technique for relatively inexpensively forming a more complex pattern of holes, for instance from a starting material that has been punched with a simple "square" pattern, and the final pattern can for instance be as in GB 2 034 240 A, GB 2 096 531 A or GB 2 108 896 A~~, or as in Claim 12~~.

On page 7, paragraph six, please amend to read as follows:

When considering holes in the starting material in an array of hexagons whose vertices are aligned in the ~~MD~~ direction of stretching, the "~~MD~~ vertex pitch" of the hexagon is the distance between the centre of one hole to the centre of the opposite hole in the ~~MD~~ stretch direction (in Figures 7 and 8, referred to below, this distance is 18.5 mm and 20.38 mm respectively), the "diagonal pitch" is the corresponding distance between respective opposite pairs of the other holes, the "major ~~MD~~ pitch" is the ~~MD~~ stretch direction distance between the centres of two adjacent holes which are aligned in the ~~MD~~ stretch direction (in Figures 7 and 8, this distance is 10.5 mm and 11.52 mm respectively), and the "minor ~~MD~~ pitch" is the ~~MD~~ stretch direction distance between the centre of the end hole of the hexagon and the centres of the next two holes of the hexagon as considered in the ~~MD~~ stretch direction (in Figures 7 and 8, this distance is 4 mm and 4.43 mm respectively).

On page 8, third paragraph, please amend to read as follows:

~~When using the method of Claim 18, it~~ It was found on stretching that if the hexagons were regular hexagons, there was a tendency for the angled oriented strands entering opposite sides of a junction to be slightly offset, i.e., not to be perfectly aligned.

This gave a slight strength reduction. It has been found that this offset can be reduced or eliminated if in the starting material the angles of any hexagon are not equal though all the sides of the hexagon can be substantially equal. In one arrangement, the hexagons are slightly foreshortened in the MD so that the MD vertex pitch is less than the diagonal pitch. The minimum ratio of the MD vertex pitch to the diagonal pitch is preferably about 0.75:1 or 0.8:1 and the maximum ratio is preferably about 0.95:1 or about 0.9:1, a suitable ratio being about 0.85:1. Put the other way and giving slightly different values, the minimum ratio may be about 1:1.1 or 1:1.14 and the maximum ratio may be about 1:1.3 or 1:1.23, a preferred value being about 1:1.17. Another way of determining the difference between the preferred hexagon and a regular hexagon is to consider the ratio between the major MD pitch and the minor MD pitch. A regular hexagon gives a ratio of 2: 1. In one experimental procedure, the ratio of the major MD pitch to the minor MD pitch was varied and the TD pitch was varied in order to keep the strand-forming zone widths the same. It was found that a ratio of within the range of about 2.1:1 to about 3.2:1 provided a reasonably regular geogrid with more or less aligned strands, though the production of such a geogrid was less likely at the extremities of the range; substantial alignment was obtained in one geogrid in a ratio range of from about 2.5:1 to about 2.7:1. The preferred ratio was about 2.6:1. At the top end of the range (nearing 3.2:1), an offset of the angled ribs occurred due to the widening of the junction, i. e. the junction had a greater dimension in the TD than in the MD. The geometrical extension was 0.4% in one example where the ratio was 3.3:1 (just above the preferred range). At the bottom end of the range (nearing 2.1:1), an offset of the angled ribs occurred due to the narrowing of the junction, i. e. the junction had a greater dimension in the MD than in the TD. The geometrical extension was 0.3% in one example where the ratio was 2:1 (just below the preferred range).

On page 9, paragraph 1, please amend to read as follows:

~~When using the method of Claim 32 or 37~~ <u>If the starting material has weakened zones</u>, it is preferred that during stretching the weakened zones have a percentage

reduction at their centre points which is at least about twice, three times or four times that of the non-weakened zones.

On page 10, paragraph 4, please amend to read as follows:

The holes can be any suitable shape, such as circular, square, rectangular or hexagonal, and suitable shapes are specifically disclosed in Figure 31 of GB 2 256 164 A. Where there are weakened zones~~ as in Claims 27 or 32~~, the holes or zones can likewise be of any suitable shape, including the elongate shape of the grooves in GB 2 128 132 A. The ratio of the distance apart of the centres of adjacent holes to the width of the holes as measured along the line connecting the centres is preferably not less than about 1.15:1 or 1.4:1 or 1.5:1 and not greater than about 3:1, though this depends on the choice of plastics material.